27. (New) The device of claim 26 wherein a combined thickness of the oxide layer, the layer of undoped silicate glass, the layer of borophosphorous silicate glass, and the second layer of plasma-enhanced tetraethyl orthosilicate is less than approximately 15k angstroms.

REMARKS/ARGUMENTS

Claims 1-4, 6-7, and 9-10 are pending. No claims are amended. New claims 20-27 are added.

Claim Rejections:

Claims 1-4, 6-7, and 9-10 were rejected under 35 USC § 103(a) as being obvious over Kuo et al. (U.S. 5,661,084).

Claims 1-4, 6-7, and 9-10 are not made obvious by Kuo et al. Kuo et al. fails to disclose or suggest the semiconductor structure as recited in claim 1, wherein a planarized layer of plasma-enhanced tetraethyl orthosilicate overlays one portion of a layer of borophosphorous silicate glass, and does not overlay another portion of the borophosphorous silicate glass layer.

The Examiner admits, and the Applicants agree, that Kuo et al. does not show a planarized layer of plasma-enhanced tetraethyl orthosilicate that overlays at least a portion of a layer of borophosphorous silicate glass, but does not overlay another portion of the borophosphorous silicate glass layer.

Furthermore, the applicant admitted prior art (AAPA) discussed in the Background of the Specification at pages 1-3 and shown in Figures 1-3, teaches planarizing the borophosphorous silicate glass layer before depositing the overlayer of plasma-enhanced tetraethyl orthosilicate. Thus, the AAPA teaches the overlayer of plasma-enhanced tetraethyl orthosilicate in direct contact with all of the layer of borophosphorous silicate glass. The AAPA therefore teaches away from the structure recited in claim 1, wherein a layer of plasma-enhanced tetraethyl orthosilicate overlays one portion of a layer of borophosphorous silicate glass, but does not overlay another portion.

Additionally, Kuo et al. shows only a single layer of plasma-enhanced tetraethyl orthosilicate. Thus, Kuo et al. fails to show a second layer of plasma-enhanced tetraethyl orthosilicate overlaying the planarized layer of plasma-enhanced tetraethyl orthosilicate and directly overlaying and being in contact with at least a portion of the borophosphorous silicate glass region, as further recited in claim 1.

The Examiner contends that it would have been obvious at the time the invention was made to separate the single layer of plasma-enhanced tetraethyl orthosilicate into multiple layers, as recited in claim 1. However, Kuo et al. and the AAPA both fail to show multiple layers of plasma-enhanced tetraethyl orthosilicate, as recited in claim 1.

The AAPA discussed above actually teaches away from depositing the plasma-enhanced tetraethyl orthosilicate in multiple layers. The plasma-enhanced tetraethyl orthosilicate provided in a single, full-thickness layer, as taught by the AAPA, was inherently more efficient and cost-effective than separating the single layer of plasma-enhanced tetraethyl orthosilicate into multiple layers, as recited in claim 1. Thus, before the invention recited in claim 1 no motivation existed to separate the single layer of plasma-enhanced tetraethyl orthosilicate into multiple layers.

Also, neither Kuo et al. nor the AAPA has suggested any motivation to have use multiple layers of plasma-enhanced tetraethyl orthosilicate, as recited in claim 1, when the layer of borophosphorous silicate glass was planarized before the layer of plasma-enhanced tetraethyl orthosilicate is deposited.

Therefore, it is unreasonable to suggest that separating the single layer of plasma-enhanced tetraethyl orthosilicate into multiple layers, as recited in claim 1, would have been obvious at the time the invention was made.

Furthermore, the Specification makes abundantly clear the advantages and unexpected results achieved by separating the single layer of plasma-enhanced tetraethyl orthosilicate into multiple layers, as recited in claim 1. Drawbacks of the single layer of plasma-enhanced tetraethyl orthosilicate shown in Kuo et al. and the AAPA stem from the inherent need to have a *planarized* layer of borophosphorous silicate glass over the layer of undoped silicate glass. A non-uniform distribution of dopant through the depth of the borophosphorous silicate glass layer and the softness of the material result in uneven thickness of the borophosphorous

silicate glass layer, even after planarizing. Also, a relatively thick layer of borophosphorous silicate glass is required when it is used as the sacrificial material in the planarizing process. This thick layer of borophosphorous silicate glass results in a low-throughput and high-maintenance process. See, page 2, line 28 through page 3, line 10.

A thin layer of borophosphorous silicate glass combined with a sacrificial layer of plasma-enhanced tetraethyl orthosilicate for the planarizing process, as provided by the present invention, results in a much simpler manufacturing process having a much higher throughput with less intensive pre-cleaning of the semiconductor device and post-processing equipment maintenance. See, page 5, line 16 through page 6, line 2.

For at least the above reasons, the invention of claim 1 is believed to be allowable over the cited art. Claims 2-4 are allowable as depending from allowable claim 1.

Although the scope of claim 6 differs from that of claim 1, the allowability of claim 6 will be apparent from the above discussion of claim 1. Claim 6 is thus believed allowable. Claims 7 and 9-10 are allowable as depending from allowable claim 6.

<ins>New Claims:</ins>

New claims 20-27 are added. Claims 20-27 are believed allowable over the cited art. As discussed above in connection with claim 1, the Examiner admits, and the Applicants agree, that Kuo et al. does not show a planarized layer of plasma-enhanced tetraethyl orthosilicate that overlays at least a portion of a layer of borophosphorous silicate glass, and does not overlay another portion of the borophosphorous silicate glass layer.

Neither does Kuo et al. show a layer of doped silicate glass having a physical contour of recessed and extended portions; and a planar layer of <ins>any</ins> dielectric material covering one or more of the recessed portions of the layer of the doped silicate glass, and exposing one or more of the extended portions, as recited in new claim 20.

The AAPA does not cure the deficiencies of Kuo et al. As discussed above, the AAPA teaches a borophosphorous silicate glass layer that is planarized <ins>before</ins> the overlayer of plasma-enhanced tetraethyl orthosilicate is deposited so that the overlayer of plasma-enhanced tetraethyl orthosilicate in direct contact with <ins>all</ins> of the layer of borophosphorous silicate glass, and <ins>none</ins> of the borophosphorous silicate glass is exposed.

Thus, Kuo et al. and the AAPA, individually and in combination, fail to disclose or suggest a planarized layer of dielectric material that overlays at least a portion of a layer of doped silicate glass, and does not overlay another portion of the doped silicate glass layer, as recited in claim 20.

For at least the above reasons, new claim 20 is believed to be allowable. New claims 21-27 are allowable as depending from allowable claim 20.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned "**Version With Markings to Show Changes Made.**"

All of the claims remaining in the application are now clearly allowable. Favorable consideration and a Notice of Allowance are earnestly solicited.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

Please add new claims 20-27 as follows:

20. (New) A semiconductor device sub-structure, comprising:

a substrate;

an oxide layer disposed over the substrate in a pattern having a physical contour of at least one or more recessed portions and at least one or more extended portions;

a layer of undoped silicate glass disposed over the patterned oxide layer and having a physical contour of recessed and extended portions corresponding to the physical contour of the oxide layer;

a layer of doped silicate glass over the layer of undoped silicate glass and having a physical contour of recessed and extended portions corresponding to the physical contour of the layer of undoped silicate glass; and

a first substantially planar layer of dielectric material covering at least one or more of the recessed portions of the layer of the doped silicate glass, and exposing at least one or more of the extended portions of the layer of the doped silicate glass layer.

21. (New) The device of claim 20, further comprising:

a second layer of dielectric material covering the first substantially planar layer of dielectric material and being in direct contact with the at least one or more extended portions of the layer of the doped silicate glass layer.

22. (New) The device of claim 21 wherein the layer of doped silicate glass is a layer of borophosphorous silicate glass.

23. (New) The device of claim 22 wherein the first layer of dielectric material is a layer of plasma-enhanced tetraethyl orthosilicate.

24. (New) The device of claim 23 wherein the second layer of dielectric material is a layer of plasma-enhanced tetraethyl orthosilicate.

25. (New) The device of claim 24 wherein the second layer of dielectric material is substantially planar.

26. (New) The device of claim 25 wherein the layer of borophosphorous silicate glass has a thickness between approximately 2k and 8k angstroms.

27. (New) The device of claim 26 wherein a combined thickness of the oxide layer, the layer of undoped silicate glass, the layer of borophosphorous silicate glass, and the second layer of plasma-enhanced tetraethyl orthosilicate is less than approximately 15k angstroms.